

ANALYTICAL APPLICATIONS OF POSITRON BEAM LIFETIME SPECTROSCOPY.  
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We are developing a defect analysis capability based on two positron beam lifetime spectrometers: the first uses a 3 MeV electrostatic accelerator and the second on the high current beam at our electron linac. The 3 MeV beam is now being used for bulk sample analysis and analysis of samples encapsulated in controlled environments. At our high current beam we are developing a low energy, microscopically focused, pulsed positron beam for smaller sample features. This beam will enable defect specific, 3-dimensional maps of defect concentrations with sub-micron location resolution. We will describe both instruments and discuss uses of these instruments in studying defect distributions in materials. This work was performed under the auspices of the US Department of Energy by LLNL under contract No. W-7405-ENG-48.